

Defining Three Test Cases for the Feasibility Analysis

Purpose of the Test Cases

The I-5 Lid Feasibility Study is examining the technical feasibility of building new lid structures over Interstate 5 in the area between Madison Street and Denny Way. As part of that analysis, the study is analyzing the financial implications of different lid options, since the amount of development (“load”) and type of development (private or public) will affect the cost of construction and financial performance over time.

Based on preliminary structural analysis—which has determined where lid structures could be built, and how much load they could support—the project team has developed three scenarios, or test cases, to assess the cost and financial feasibility of alternative lid programs. Each test case is formulated to answer a key question. Answers to those questions will help inform potential next steps.

None of the test cases represent an actual or recommended site design or development proposal. The study will not result in a “preferred alternative.” It will speak to the range of technical and financial feasibility and challenges associated with lidding all or a portion of the area—including engineering, costs, financing and maintenance—and key issues that will need to be addressed. Development of any new lid structure would need the full support and buy-in of the Washington State Department of Transportation, which owns and operates I-5.

Public Benefit Outcomes:

Lidding over Interstate 5 could help achieve a number of desired public benefits. All three test cases seek to achieve a core set of these benefits, including:

- Improved pedestrian, bike and transit connectivity between adjacent neighborhoods, including new and improved vertical connectivity through the site and new high-quality streetscapes;
- Increased seismic resilience;
- Noise mitigation in certain sections;
- Reduced direct exposure to pollutants; and
- Reduced visual impacts and other environmental benefits.

Other core public benefits could also be achieved, but vary based on the scale and specifics of each test cases, including:

- Public open space (including public park space and privately-owned public spaces);
- New civic and community space, in addition to new public open space; and
- Affordable housing and/or payments to the affordable housing fund.

The following pages provide an overview of each proposed Test Case, including the core question each seeks to answer and the core assumptions that define it. Test Cases 1 and 2 provide “bookends” (the lowest load, and potentially lowest capital cost case; and the highest load, but also the highest potential revenue-generating case). Test Case 3 is a mid-density (or medium load) hybrid that mixes private investment with significant public benefit outcomes.

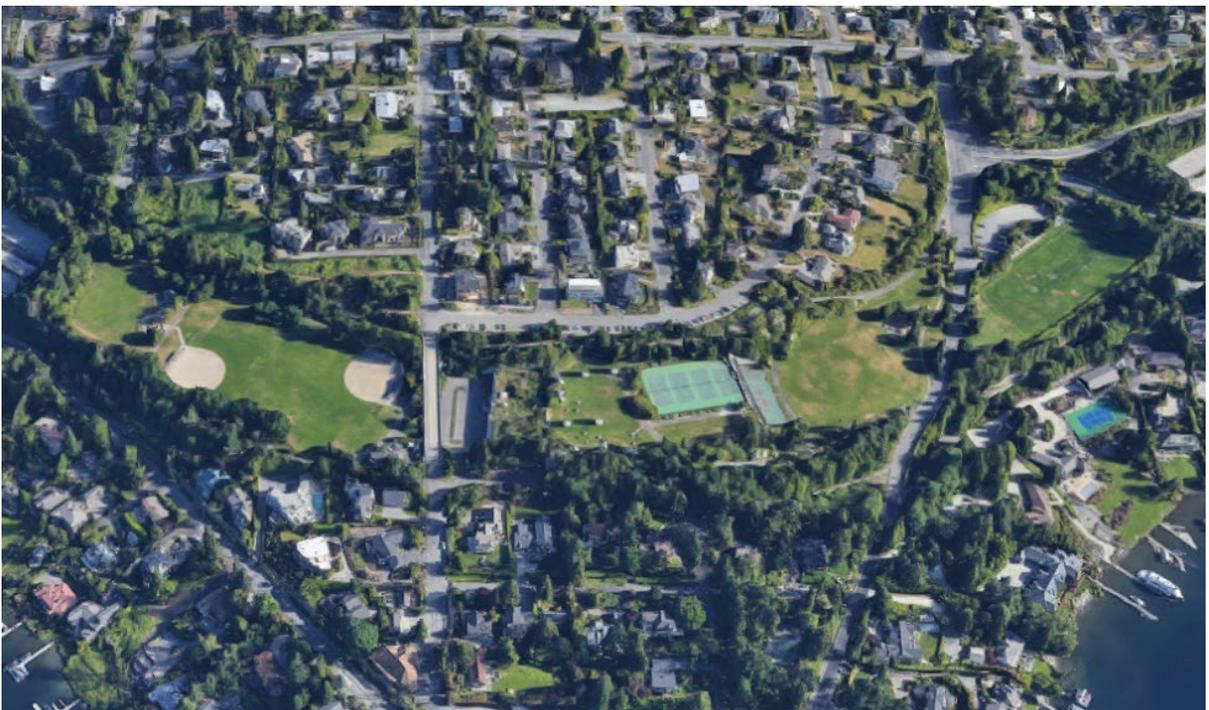
Attachment A provides plan-view illustrations of each Test Case, showing how the assumptions for each Test Case could be physically arranged in the lid area, taking into account load capacity, grade changes and urban context. These images are for analysis purposes only; *they do not represent a recommended or desired development program.*

The project team sought input from the Lid Feasibility Study Committee on a draft set of assumptions at their meeting on December 11, 2019. The Committee’s input and subsequent work with the project’s Technical Advisory Team informed the final assumptions that are summarized in this document and will be used as input for the consultant team’s economic and financial analysis.

The Park Lid

What is the lowest capital cost to achieve the core public benefit outcomes?

- Description** This test case assumes the most basic lid structure developed as “standard” park space (landscaping, lighting, seating, pathways). Its purpose is to establish a baseline cost. More amenity-rich open spaces (e.g., active recreation spaces, programmable spaces, etc.) or the addition of structures for civic or other uses would require additional investment.
- Assumptions** Assumes the most basic (though still complex) lid structure to meet safety, seismic and operational requirements, including fire and life safety requirements for the underlying tunnel and modifications to support the lid while maintaining or improving safe operation of I-5. A “per square foot” assumption for park development is being provided by Seattle Parks and Recreation.
- Development** There would be no development on the lid apart from some “pavilion” structures needed to address edge conditions (i.e., provide for access to the lid in areas with significant grade change). The illustration on Attachment A shows where such structures would likely be located.
- Ramps** Analysis for this test case will assume retention of all on- and off-ramps, consistent with establishing a baseline lid cost. Removal, reconfiguration or relocation of ramps would enhance the lid’s functionality and expand the amount of park space, but also add considerable capital cost (not only for construction but also for providing alternative I-5 access and modifications to the street network elsewhere). Further studies and cost-benefit analysis related to ramp modifications would be required to inform future decision-making.
- Comparable** The existing lid over I-90 on Mercer Island is roughly comparable, though it contains more amenities than what is assumed for this baseline test case.



The Mercer Island lid over I-90 is primarily green space and landscaping, with additional amenities to support active recreation uses.

Maximum Private Investment

What is the maximum potential for market-rate development to help pay for a lid?

Description This test case assumes the maximum development on the lid based on its structural capacity and application of standard development requirements for low-, mid- and high-rise development, generally based on prevailing “downtown” densities. All development would be market-rate in order to maximize revenue-generation that could offset the lid structure’s capital costs.

Assumptions The structural requirements related to safety, seismic resilience and operations are consistent with Test Case 1. Additionally, standard development requirements would be applied to private development:

Privately Owned Public Space – 20 s.f. per 1000 s.f of office; and 15% of residential parcels

Parking – 25% of office square footage; 15% of market-rate residential square footage (due to physical challenge of delivering parking within each building envelope, the analysis will calculate cost of delivering 10% of the assumed parking requirement onsite with the remainder delivered on lid-adjacent parcels, including the cost of site acquisition and parking construction.

Affordable Housing – MHA payments at the following rates (assumes no on-site units):

	Low Rise	Mid Rise	High Rise
Residential	\$13/s.f. (or 6% of units)	\$20/s.f. (or 9% of units)	\$33/s.f. (or 11% of units)
Commercial	\$8/s.f.	\$12/s.f.	\$15/s.f.

Development Built space on the lid would be maximized based on the load capacity, as defined through the preliminary structural analysis (yielding low-, mid- and high-rise buildings). Publicly accessible open space and connectivity through the sites would be achieved based on setbacks and open space requirements (similar to the existing Union Square development adjacent to Freeway Park). The map on the back of this page illustrates the distribution of approximate building footprints by development intensity (load capacity) assumed for this exercise. The mix of uses (commercial, residential, etc.) will be established based on the market analysis, assuming development seeking maximum profitability.

Ramps Analysis for this test case assumes retention of all on- and off-ramps. The project team will identify potential locations for possible “over-ramp” development (as in the existing Seattle Municipal Tower). Additionally, a scenario with removal of the Olive Way on- and off- ramps will be analyzed.

Comparable The Capitol Crossings lid in Washington, DC, is a privately funded \$1.3 billion project. It contains 2.2 million square feet in five mixed-use buildings over a 7-acre site that spans three long blocks over I-395. Importantly, the terrain here is much flatter than the context of I-5 in downtown Seattle.



Mid-Density Hybrid

How would a context-sensitive public-private mix of development affect financial performance?

- Description** This test case considers the financial impact of a more mixed approach to development on the lid, with public park space and civic uses mixed with on-site affordable housing and market-rate development (including residential, commercial and hospitality). Like the other test cases, this is *not* a recommended development program. Its purpose is to test the financial outcomes of an illustrative “mid-density” approach that mixes public and private investment.
- Assumptions** This is the most assumption-driven test case. As in Test Case 2, all structural requirements related to safety, seismic resilience and operations would be met, and the same standard development requirements and parking assumptions would apply. However, other assumptions would drive a lower overall intensity of development (compared to Test Case 2) and inclusion of public-serving uses, including:
Public Open Space – same as Test Case 2 for market-rate development *plus* 5 acres of public park space
Civic Uses – 5% of total building square footage (but no assumed program for how that space is used)
Affordable Housing – (1) All market-rate development will pay MHA fees, same as Test Case 2 *and* (2) the residential development square footage will be structured with the aim of achieving roughly 60% market-rate, 15% subsidized for middle income households (between 60% and 120% of area median income), and 25% for lower-income households (60% of area median income and below). These percentages are for analysis purposes only, to reflect public policy priorities and test the effect on overall financial feasibility. Funding for affordable housing development and the specific mix of unit types will not be determined in the test case analysis; just the cost of delivering “land” on the lid for those developments at discounted rates of \$300/s.f. for lower-income, and \$800/s.f. for middle-income.
- Development** Building intensity is lower than Test Case 2, factoring in both the load capacity and the urban context. The illustration on Attachment A shows the potential resulting distribution of open space and approximate building footprints. The use mix (commercial, residential, etc.) will be determined by the market analysis.
- Ramps** Two variations will be analyzed: one with all ramps retained; one with Olive Way on- and off-ramps removed (though any future ramp removal will require substantial analysis and mitigation).
- Comparable** While it is not a lid project, Yesler Terrace is a recent development that mixes affordable and market-rate housing (25/75% mix) with commercial space, community-serving uses (2% of total building space) and 3.2 acres of public open space.



Summary of Key Assumptions

	The Park Lid	Max Private Investment	Mid-Density Hybrid
Park Space¹	~ 11.5 acres	None	~ 5 acres
Privately-Owned Public Space	None	20 s.f./1000 gross s.f. of office; 15% of total area for residential parcels	20 s.f./1000 gross s.f. of office; 15% of total area for residential parcels
Civic Building Space²	Limited (~ 15k s.f.)	None	5% of total building s.f.
Affordable Housing	No housing	MHA payments ³ (assumes no on-site units)	MHA payments for all market-rate development; ³ <i>plus</i> 25% of residential s.f. reserved for lower-income housing and 15% for middle-income housing ⁴
Parking⁵	None	25% of Commercial s.f. 15% of Market Rate Resid. s.f.	25% of Commercial s.f. 15% of Market Rate Resid. s.f.
Ramps⁶	All ramps remain	Version 1: All ramps remain; over-ramp dev. may be considered; Version 2: Olive Way On/Off ramps removed ⁶	Version 1: All ramps remain; over-ramp dev. may be considered; Version 2: Olive Way On/Off ramps removed ⁶

Notes

- 1 Assumes a per-square-foot cost for standard park development; more amenity-rich park space would cost more.
- 2 Assumes delivery of building space only; cost to support specific programs (e.g., school, fire station) would be extra.
- 3 Mandatory Housing Affordability Fee payments set at:

	Low Rise	Mid Rise	High Rise
<i>Residential</i>	\$13/s.f. (or 6% of units)	\$20/s.f. (or 9% of units)	\$33/s.f. (or 11% of units)
<i>Commercial</i>	\$8/s.f.	\$12/s.f.	\$15/s.f.

- 4 “Lower income” is defined at 60% of area median income and below; “middle income” as households between 60 and 120% of area median income. The target of 25% affordable for lower-income households is consistent with policy guiding redevelopment at nearby Yesler Terrace; and additional 15% for middle-income housing reflects the City’s current policy priority as well as market need. The cost of building the affordable housing will not be included in the financial analysis; just the cost of delivering the “land” as part of a future lid investment, at discounted rates of \$300/s.f. for lower-income and \$800/s.f. for middle-income.
- 5 Parking assumptions based on anticipated market desire; City does not require parking in downtown development. Due to physical challenge of delivering parking within each building envelope, the analysis will calculate cost of delivering 10% of the assumed parking requirement onsite with the remainder delivered on lid-adjacent parcels, including the cost of site acquisition and construction.
- 6 All on- and off-ramps are necessary to serve existing and projected vehicular access needs for I-5 in Downtown. Any ramp modification or removal will require significant future analysis to identify viable mitigation investments to maintain or improve I-5 and Downtown street network operations and address impacts to up- and down-stream communities. Further studies, outside of the scope of the current study, would be required to perform a cost-benefit analysis for future decision-making.

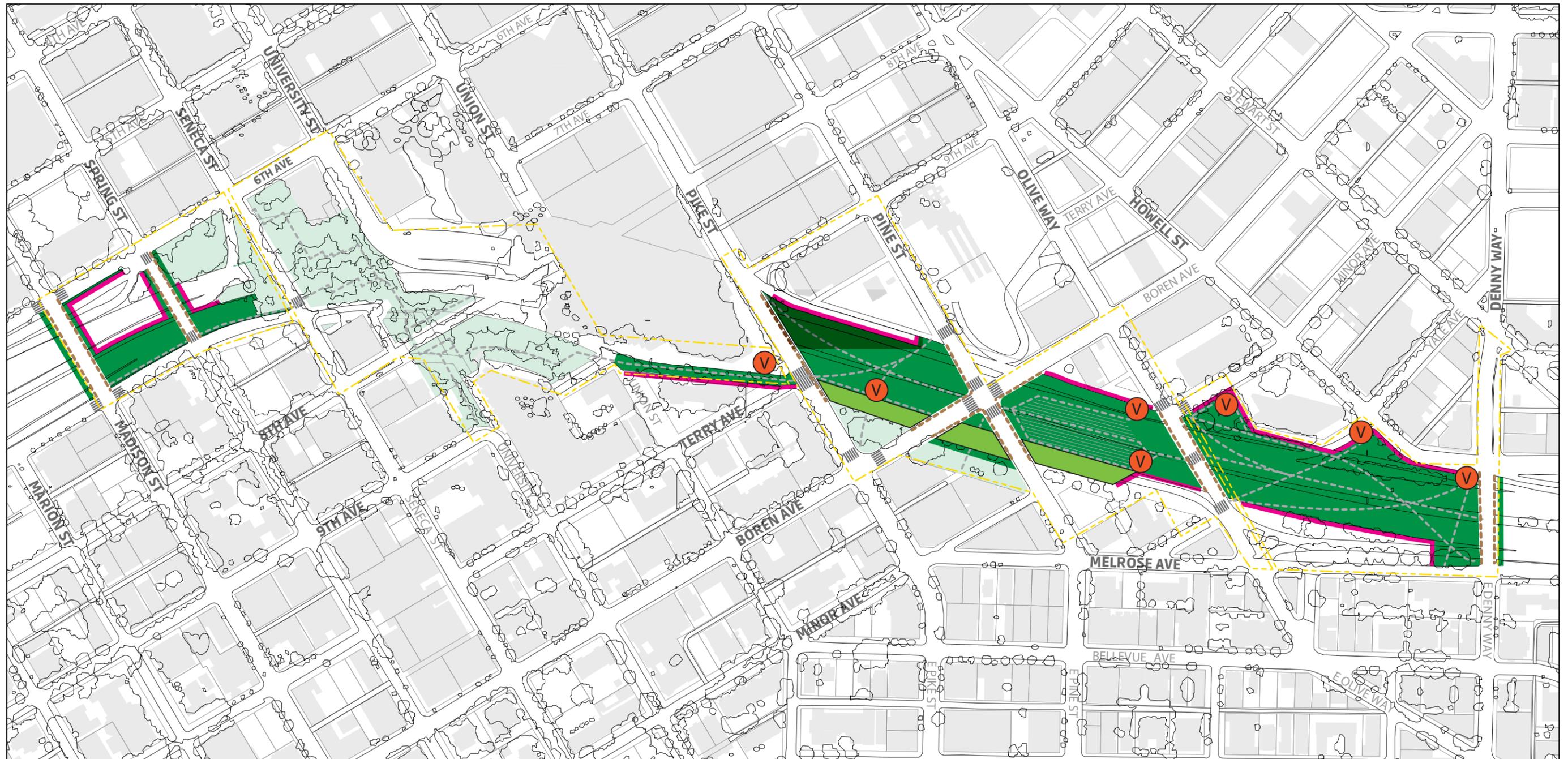
Other Notes: All test cases include placement of a Fire, Life Safety facility, as required, which will be a non-revenue-generating use. Also, sizing of market-rate program components will be informed by the lid's structural capacity, typical size requirements, and the consultant team's real estate market scan (after accounting for the area required for other uses).

ATTACHMENT A: Plan View Illustrations

The following five pages provide plan view illustrations of each Test Case, showing how the assumptions for each could be physically arranged in the lid area, taking into account load capacity, grade changes and urban context. There are two plan views for both Test Case 2 and Test Case 3, illustrating the shift in physical layout and development pattern with the Olive Way on- and off-ramps retained and removed.

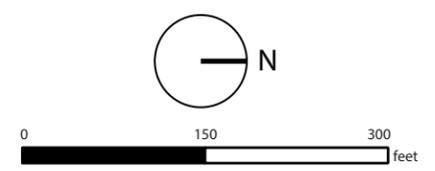
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Test Case 1

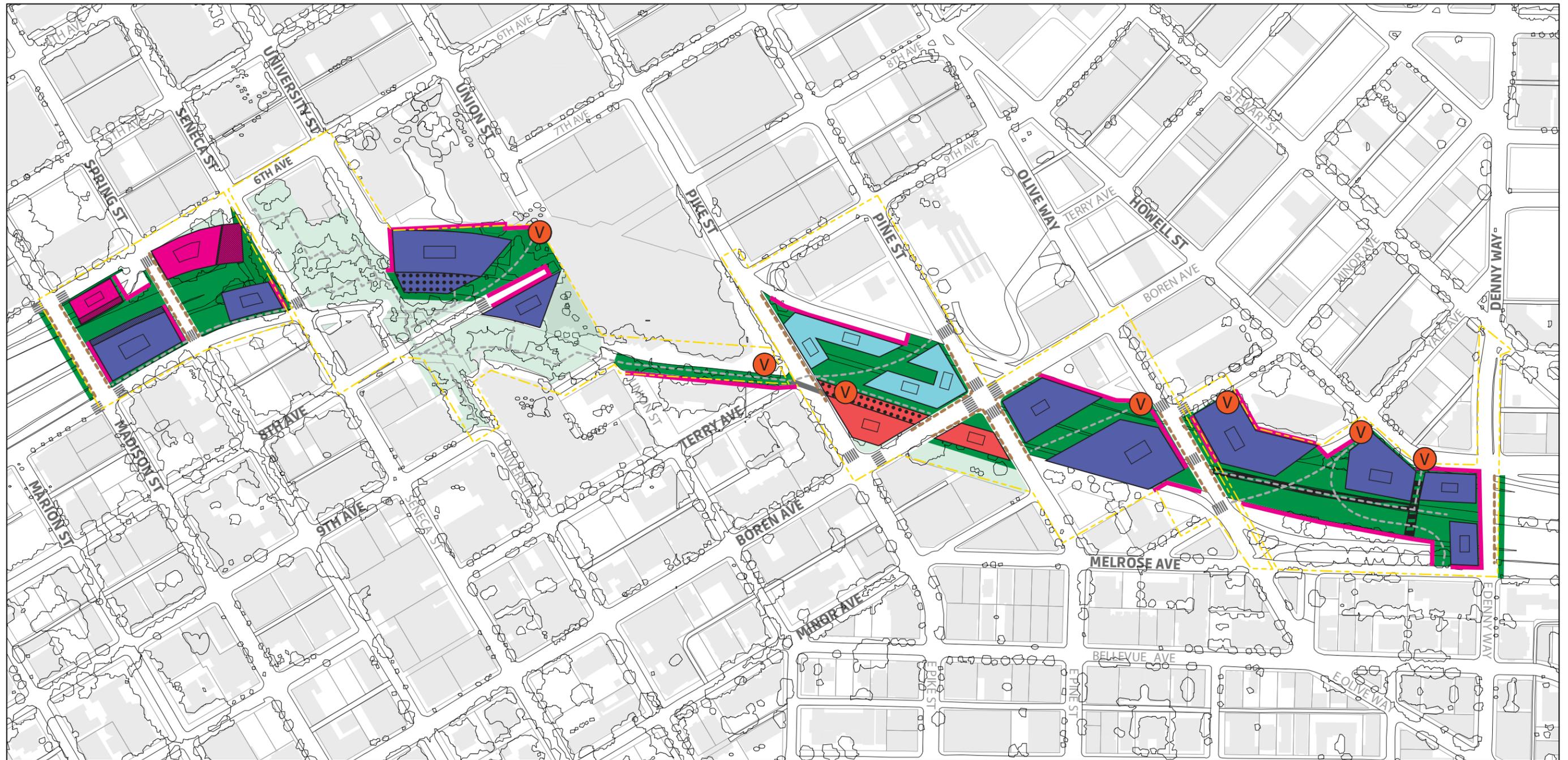


Legend

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|--------------------------------|------------------------------|----------------------------|-------------------------|
| Structural Assessment Boundary | Existing Open Space | Pavilion: Up to 30ft | Improved Pedestrian Way |
| Parcel Boundary | Test Case Lid Surface | Low-Rise: 70ft | New Pathways |
| Roadway Pavement Edge | Existing Building Footprints | Mid-Rise: 200ft | Crosswalks |
| Vertical Edges Above Grade | Building Plinth | High-Rise: 400ft | Vertical Circulation |
| Bridge Connection | Building Cantilever | Downtown: 680 ft High-Rise | Fire Lane |

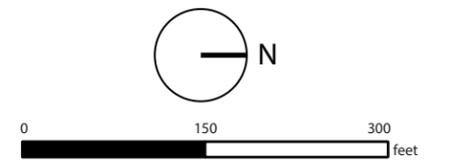


Test Case 2 (with Olive Way ramp)

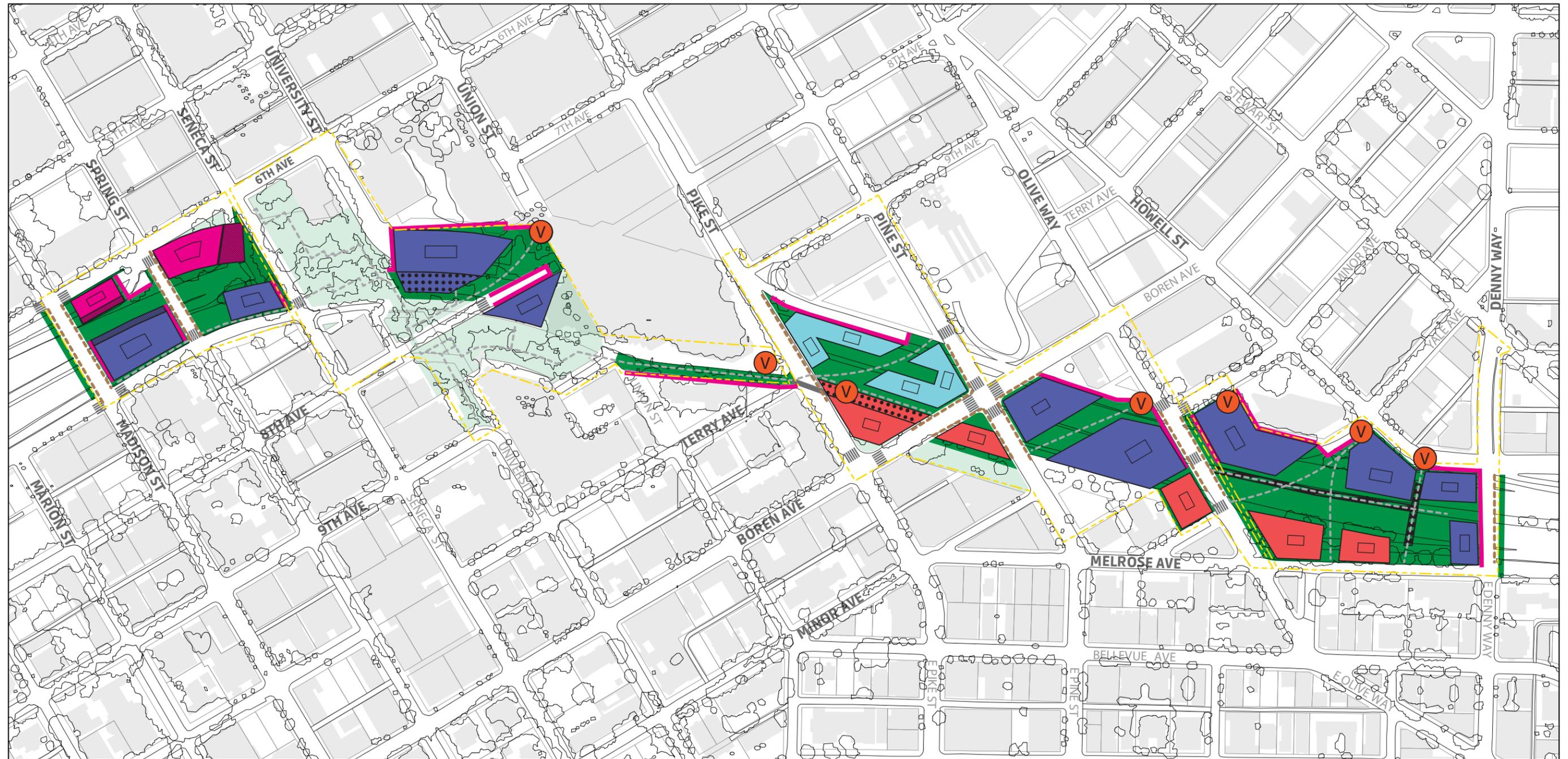


Legend

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| Structural Assessment Boundary | Existing Open Space | Pavilion: Up to 30ft | Improved Pedestrian Way |
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| Roadway Pavement Edge | Existing Building Footprints | Mid-Rise: 200ft | Crosswalks |
| Vertical Edges Above Grade | Building Plinth | High-Rise: 400ft | Vertical Circulation |
| Bridge Connection | Building Cantilever | Downtown: 680 ft High-Rise | Fire Lane |

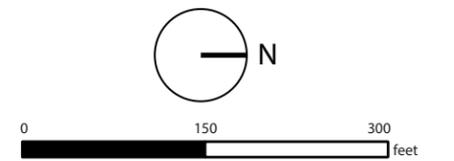


Test Case 2 (Olive Way ramp removed)

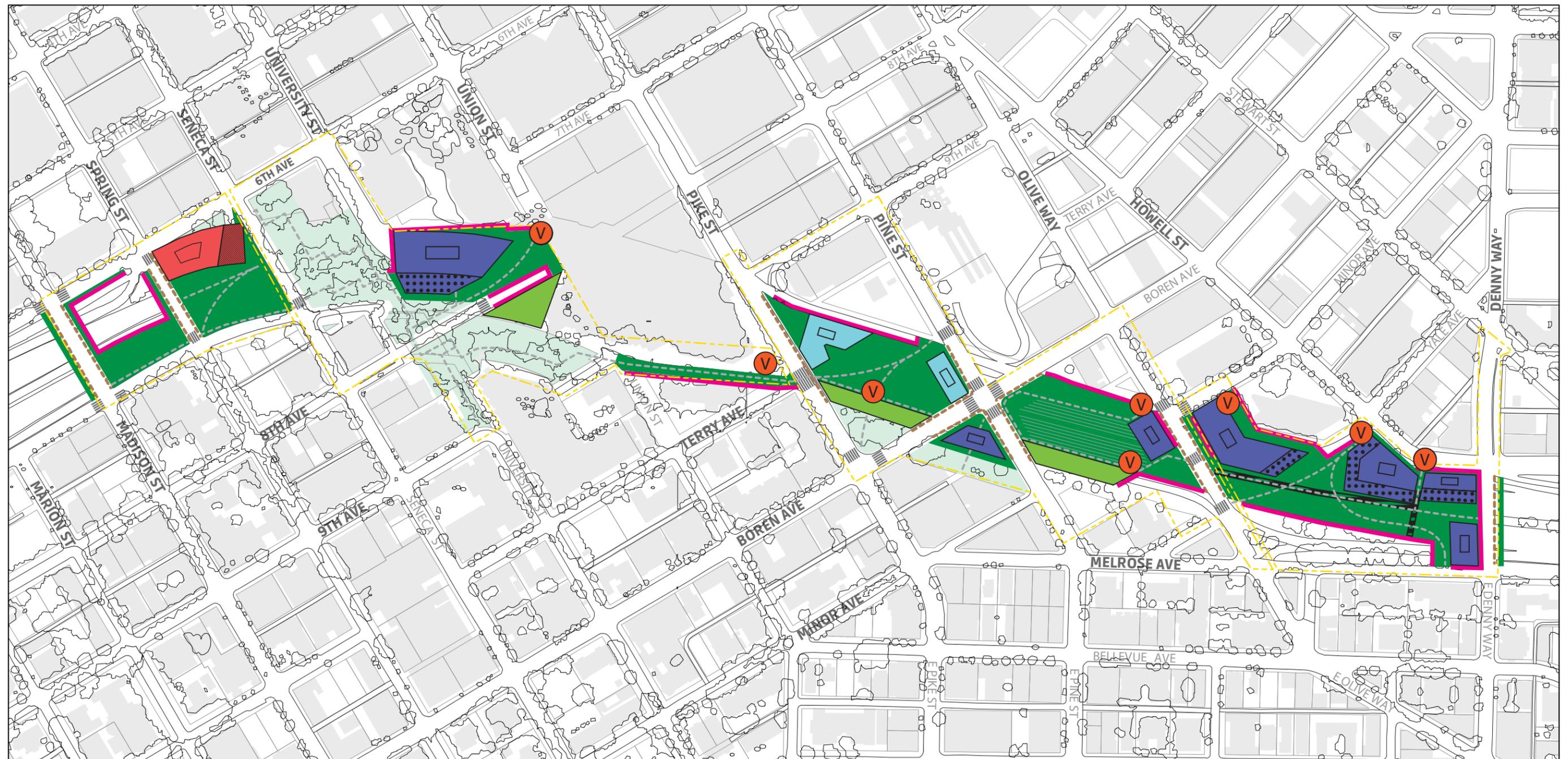


Legend

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|--------------------------------|------------------------------|----------------------------|-------------------------|
| Structural Assessment Boundary | Existing Open Space | Pavilion: Up to 30ft | Improved Pedestrian Way |
| Parcel Boundary | Test Case Lid Surface | Low-Rise: 70ft | New Pathways |
| Roadway Pavement Edge | Existing Building Footprints | Mid-Rise: 200ft | Crosswalks |
| Vertical Edges Above Grade | Building Plinth | High-Rise: 400ft | Vertical Circulation |
| Bridge Connection | Building Cantilever | Downtown: 680 ft High-Rise | Fire Lane |

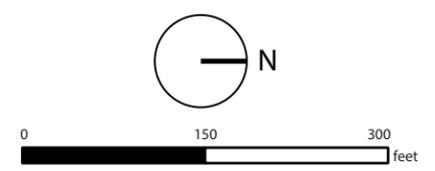


Test Case 3 (with Olive Way ramp)

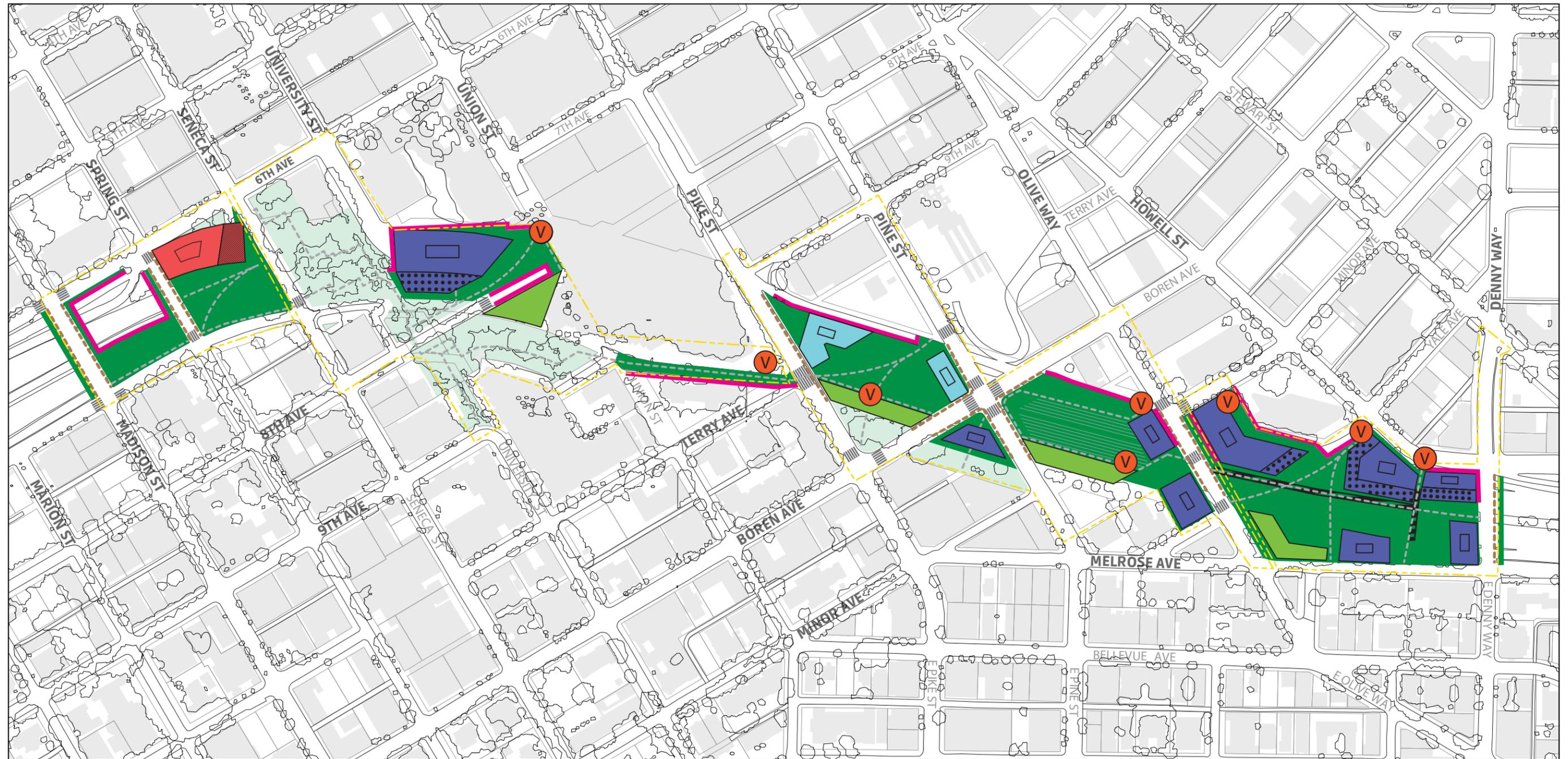


Legend

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|--------------------------------|------------------------------|----------------------------|-------------------------|
| Structural Assessment Boundary | Existing Open Space | Pavilion: Up to 30ft | Improved Pedestrian Way |
| Parcel Boundary | Test Case Lid Surface | Low-Rise: 70ft | New Pathways |
| Roadway Pavement Edge | Existing Building Footprints | Mid-Rise: 200ft | Crosswalks |
| Vertical Edges Above Grade | Building Plinth | High-Rise: 400ft | Vertical Circulation |
| Bridge Connection | Building Cantilever | Downtown: 680 ft High-Rise | Fire Lane |



Test Case 3 (Olive Way ramp removed)



Legend

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|--------------------------------|------------------------------|----------------------------|-------------------------|
| Structural Assessment Boundary | Existing Open Space | Pavilion: Up to 30ft | Improved Pedestrian Way |
| Parcel Boundary | Test Case Lid Surface | Low-Rise: 70ft | New Pathways |
| Roadway Pavement Edge | Existing Building Footprints | Mid-Rise: 200ft | Crosswalks |
| Vertical Edges Above Grade | Building Plinth | High-Rise: 400ft | Vertical Circulation |
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